

Index to Volume 19 (1998)

Number 1/2 pp. 1–84
Number 3 pp. 85–132

Number 4 pp. 133–196
Number 5/6 pp. 197–294

Article Index

Number 1/2

An overview of the technology of fibre-reinforced plastics for design purposes
K.L. Edwards 1

Multiple material solid free-form fabrication by selective area laser deposition
K.J. Jakubenas, J.M. Sanchez and H.L. Marcus 11

Selection of ceramics for methanol fuel injector plungers based on tribological characteristics when coupled with 4140 steel
J.S. Lyons 19

The influence of rubber bush compliance on vehicle suspension movement
M.V. Blundell 29

Development of a knowledge-based system for materials management
K.R. Trethewey, R.J.K. Wood, Y. Puget and P.R. Roberge 39

A designers' guide to engineering polymer technology
K.L. Edwards 57

Technical Report

Growing interest in TPUs for automobile design
B. LeMonte 69

Number 3

Thermal effects on polymer matrix composites: Part 1. Thermal cycling
N.L. Hancox 85

Thermal effects on polymer matrix composites: Part 2. Thermal degradation
N.L. Hancox 93

A finite element analysis of elasto-plastic contact problems in metal forming
F.H. Lin and A.A. Tseng 99

Structure and properties of iron based self-lubricant wear-resistant gradient layer
Y. Wang and W. Huang 109

Towards an intelligent CAD system for multi-layer electromagnetic absorber design
M. Cao, J. Yuan, Q. Li, B. Wang, G. Xu, S. Qin and X. Fang 113

Technical Report

A brief insight into the selection and use of engineering adhesives for preliminary joint design
K.L. Edwards 121

Number 4

Materials selection for optimal environmental impact in mechanical design
L. Holloway 133

On testing of the stiffness and the dent resistance of autobody panels
G. Ekstrand and N. Asnafi 145

The effects of strain rate and hardness on the material constants of nitrile rubbers
S.J. Jerrams, M. Kaya and K.F. Soon 157

X-ray structure analysis on the particle of metal ultra-fine powder nickel
P. Liu, Z.M. Gao, Y.M. Wang and J. Lei 169

Cooling process and mechanical properties design of high carbon hot rolled high strength (HRHS) steels
C. Liu, Y. Liu, C. Ji, Q. Zhu and J. Zhang 175

Dynamic crashing and impact energy

absorption of extruded aluminum square tubes
D.-K. Kim, S. Lee and M. Rhee 179

Number 5/6

The modern olympic vaulting pole
S.C. Burgess 197

Manufacturing process selection in engineering design. Part 1: the role of process selection
A.M. Lovatt and H.R. Shercliff 205

Manufacturing process selection in engineering design. Part 2: a methodology for creating task-based process selection procedures
A.M. Lovatt and H.R. Shercliff 217

Co-sintering of tungsten alloy slurry coated alumina composites and their properties
K. Biswas and G.S. Upadhyaya 231

Rapid pattern based powder sintering technique and related shrinkage control
J.G. Zhou and Z. He 241

Mechanical properties of high strength quenched steels with minute amounts of ferrite
L. Cheng, W. Hua and L. Yunxu 249

Composition, structure and properties of gradient thermal barrier coatings (TBCs) produced by electron beam physical vapor deposition (EB-PVD)
M. Movchan and Y. Rudoy 253

A numerical method for determining the kinetic constants of gas-liquid

- metal interactions in N-Ni-20Cr
and N-ASTM F-75 alloy systems
*H. Mancha, M. Herrera, J. Méndez,
D. Ablitzer and M. Méndez* 259

- Fracture toughness of austempered
chilled ductile iron
J. Hemanth 269

Technical Report

- Improving pump performance in severe
applications
J.P. Boylan 279

Author Index

- Ablitzer, D. 259
Asnafi, N. 145
- Biswas, K. 231
Blundell, M.V. 29
Boylan, J.P. 279
Burgess, S.C. 197
- Cao, M. 113
Cheng, L. 249
- Edwards, K.L. 1, 57, 121
Ekstrand, G. 145
- Fang, X. 113
- Gao, Z.M. 169
- Hancox, N.L. 85, 93
He, Z. 241
Hemanth, J. 269
Herrera, M. 259
Holloway, L. 133
Hua, W. 249
Huang, W. 109
- Jakubenas, K.J. 11
Jerrams, S.J. 157
Ji, C. 175
- Kaya, M. 157
Kim, D.-K. 179
- Lee, S. 179
Lei, J. 169
LeMonte, B. 69
Li, Q. 113
Lin, F.H. 99
Liu, C. 175
Liu, P. 169
Liu, Y. 175
Lovatt, A.M. 205, 217
Lyons, J.S. 19
- Mancha, H. 259
Marcus, H.L. 1
Méndez, J. 259

- Méndez, M. 259
Movchan, M. 253
- Puget, Y. 39
- Qin, S. 113
- Rhee, M. 179
Roberge, P.R. 39
Rudoy, Y. 253
- Sanchez, J.M. 11
Sherclif, H.R. 205, 217
Soon, K.F. 157
- Trethewey, K.R. 39
Tseng, A.A. 99
- Upadhyaya, G.S. 231
- Wang, B. 113
Wang, Y. 109
Wang, Y.M. 169
Wood, R.J.K. 39
- Xu, G. 113
- Yuan, J. 113
Yunxu, L. 249
- Zhang, J. 175
Zhou, J.G. 231
Zhu, Q. 175

Keyword Index

β -phase

- gradient tbc's; EB-PVD; bond coat;
ceramic layer; TGZ 253

absorption

- nitrogen; kinetics; constants; des-
orption 259

adhesives

- materials selection; design 121

alumina substrate

- co-sintering; tungsten-Cu/Ag over-
lay; slurry coating 231

ambient temperature creep

- sound emission; minute amounts of
the plastic deformation resistance;
low cycle fatigue 249

austempering

- fracture toughness; chill 269

autobody panels

- stiffness; dent resistance; punches
145

binder

- rapid pattern; powder sintering;
green compact; shrinkage control;
241

bismaleimide

- resin; fibre; composite; thermal
degradation; carbon-fibre; poly-
imide; PEEK 93

bond coat

- gradient TBCs; EB-PVD; ceramic
layer; β -phase; TGZ 253

carbon-fibre

- resin; fibre; composite; thermal
cycling; thermal stress; epoxy; poly-
imide 85

carbon-fibre

- resin; fibre; composite; thermal
degradation; bismaleimide; poly-
imide; PEEK 93

ceramic layer

- gradient TBCs; EB-PVD; bond coat;
 β -phase; TGZ 253

ceramics

- friction; wear; methanol 19

chill

- fracture toughness; austempering;
269

co-sintering

- alumina substrate; tungsten-Cu/Ag
overlay; slurry coating 231

column

- spring; stress analysis; design for
manufacture 197

composite

- resin; fibre; thermal cycling; thermal
stress; carbon-fibre; epoxy; poly-
imide 85

composite

- resin; fibre; thermal degradation;
carbon-fibre; bismaleimide; poly-
imide; PEEK 93

composites

- fibre-reinforced plastics; technolo-
gy; design 1

constants

- nitrogen; kinetics; absorption; des-
orption 259

contact element

- spring element; finite element; elas-
to-plastic; metal forming process-
es; indentation 99

controlled cooling

- hot rolled high strength steel;
isothermal treatment design;
mechanical property 175

corrosion

- knowledge-based system; materials
selection; failure analysis; materials
performance; engineering design;
marine coatings; seawater 39

curve fitting

- hyperelasticity; strain energy densi-
ty function; plane strain indentation
157

- dent resistance**
stiffness; autobody panels; punches 145
- design analysis**
design methods and tools; engineering design research 29
- design for manufacture**
spring; column; stress analysis; 197
- design methods and tools**
design analysis; engineering design research 29
- design**
adhesives; materials selection; 121
- design**
engineering polymers; plastics; technology; 57
- design**
fibre-reinforced plastics; composites; technology; 1
- desorption**
nitrogen; kinetics; constants; absorption; 259
- dynamic compressive test**
space frame; impact energy absorption; 179
- EB-PVD**
gradient TBCs; bond coat; ceramic layer; β -phase; TGZ 253
- elasto-plastic**
contact element; spring element; finite element; metal forming processes; indentation 99
- electromagnetic wave**
multilayer absorber; intelligent CAD; pure-shape method 113
- engineering design research**
design analysis; design methods and tools; 29
- engineering design**
knowledge-based system; materials selection; failure analysis; corrosion; materials performance; marine coatings; seawater 39
- engineering polymers**
plastics; technology; design 57
- environmental impact**
materials selection; mechanical design; 'green' design 133
- epoxy**
resin; fibre; composite; thermal cycling; thermal stress; carbon-fibre; polyimide 85
- failure analysis**
knowledge-based system; materials selection; corrosion; materials performance; engineering design; marine coatings; seawater 39
- fibre-reinforced plastics**
composites; technology; design 1
- fibre**
resin; composite; thermal cycling; thermal stress; carbon-fibre; epoxy; polyimide 85
- fibre**
resin; composite; thermal degradation; carbon-fibre; bismaleimide; polyimide; PEEK 93
- finite element**
contact element; spring element; elasto-plastic; metal forming processes; indentation 99
- fracture toughness**
austempering; chill 269
- friction**
wear; ceramics; methanol 19
- gradient TBCs**
EB-PVD; bond coat; ceramic layer; β -phase; TGZ 253
- green compact**
rapid pattern; powder sintering; shrinkage control; binder 241
- 'green' design**
materials selection; mechanical design; environmental impact; 133
- hot rolled high strength steel**
controlled cooling; isothermal treatment design; mechanical property 175
- hyperelasticity**
strain energy density function; curve fitting; plane strain indentation 157
- impact energy absorption**
space frame; dynamic compressive test 179
- indentation**
contact element; spring element; finite element; elasto-plastic; metal forming processes; 99
- intelligent CAD**
electromagnetic wave; multilayer absorber; pure-shape method 113
- iron-based self-lubricant**
metal-coated casting; wear-resistant gradient layer; microstructure; wear-resistance 109
- isothermal treatment design**
hot rolled high strength steel; controlled cooling; mechanical property 175
- kinetics**
nitrogen; constants; absorption; desorption 259
- knowledge-based system**
materials selection; failure analysis; corrosion; materials performance; engineering design; marine coatings; seawater 39
- low cycle fatigue**
sound emission; minute amounts of the plastic deformation resistance; ambient temperature creep; 249
- materials performance**
knowledge-based system; materials selection; failure analysis; corrosion; engineering design; marine coatings; seawater 39
- marine coatings**
knowledge-based system; materials selection; failure analysis; corrosion; materials performance; engineering design; seawater 39
- materials selection**
adhesives; design 121
- materials selection**
knowledge-based system; failure analysis; corrosion; materials performance; engineering design; marine coatings; seawater 39
- materials selection**
mechanical design; environmental impact; 'green' design 133
- mechanical design**
materials selection; environmental impact; 'green' design 133
- mechanical property**
hot rolled high strength steel; controlled cooling; isothermal treatment design; 175
- metal forming processes**
contact element; spring element; finite element; elasto-plastic; indentation 99
- metal-coated casting**
iron-based self-lubricant; wear-resistant gradient layer; microstructure; wear-resistance 109
- methanol**
friction; wear; ceramics; 19
- microstructure control**
rapid prototyping; selective area laser deposition; titanium oxide; silicon oxide 11
- microstructure**
iron-based self-lubricant; metal-coated casting; wear-resistant gradient layer; wear-resistance 109
- minute amounts of the plastic deformation resistance**
sound emission; ambient temperature creep; low cycle fatigue 249

multilayer absorber

electromagnetic wave; intelligent CAD; pure-shape method 113

nitrogen

kinetics; constants; absorption; desorption 259

PEEK

resin; fibre; composite; thermal degradation; carbon-fibre; bismaleimide; polyimide; 93

plane strain indentation

hyperelasticity; strain energy density function; curve fitting; 157

plastics

engineering polymers; technology; design 57

polyimide

resin; fibre; composite; thermal cycling; thermal stress; carbon-fibre; epoxy; 85

polyimide

resin; fibre; composite; thermal degradation; carbon-fibre; bismaleimide; PEEK 93

powder sintering

rapid pattern; green compact; shrinkage control; binder 241

punches

stiffness; dent resistance; autobody panels; 145

pure-shape method

electromagnetic wave; multilayer absorber; intelligent CAD; 113

rapid pattern

powder sintering; green compact; shrinkage control; binder 241

rapid prototyping

selective area laser deposition; microstructure control; titanium oxide; silicon oxide 11

resin

fibre; composite; thermal cycling; thermal stress; carbon-fibre; epoxy; polyimide 85

resin

fibre; composite; thermal degradation; carbon-fibre; bismaleimide; polyimide; PEEK 93

Rietveld-Fourier method

ultra-fine powder; size distribution; strain 169

seawater

knowledge-based system; materials selection; failure analysis; corrosion; materials performance; engineering design; marine coatings; 39

selection for cost

selection of material processes; systematic design 205

selection for cost

selection of material processes; systematic design 217

selection of material processes

selection for cost; systematic design 205

selection of material processes

selection for cost; systematic design 217

selective area laser deposition

rapid prototyping; microstructure control; titanium oxide; silicon oxide 11

shrinkage control

rapid pattern; powder sintering; green compact; binder 241

silicon oxide

rapid prototyping; selective area laser deposition; microstructure control; titanium oxide; 11

size distribution

ultra-fine powder; Rietveld-Fourier method; strain 169

slurry coating

co-sintering; alumina substrate; tungsten-Cu/Ag overlay; 231

sound emission

minute amounts of the plastic deformation resistance; ambient temperature creep; low cycle fatigue 249

space frame

impact energy absorption; dynamic compressive test 179

spring element

contact element; finite element; elasto-plastic; metal forming processes; indentation 99

spring; column

stress analysis; design for manufacture 197

stiffness

dent resistance; autobody panels; punches 145

strain energy density function

hyperelasticity; curve fitting; plane strain indentation 157

strain

ultra-fine powder; Rietveld-Fourier method; size distribution; 169

stress analysis

spring; column; design for manufacture 197

systematic design

selection of material processes; selection for cost; 205

systematic design

selection of material processes; selection for cost; 217

TGZ

gradient TBCs; EB-PVD; bond coat; ceramic layer; β -phase; 253

technology

engineering polymers; plastics; design 57

technology

fibre-reinforced plastics; composites; design 1

thermal cycling

resin; fibre; composite; thermal stress; carbon-fibre; epoxy; polyimide 85

thermal degradation

resin; fibre; composite; carbon-fibre; bismaleimide; polyimide; PEEK 93

thermal stress

resin; fibre; composite; thermal cycling; carbon-fibre; epoxy; polyimide 85

titanium oxide

rapid prototyping; selective area laser deposition; microstructure control; silicon oxide 11

tungsten-Cu/Ag overlay

co-sintering; alumina substrate; slurry coating 231

ultra-fine powder

Rietveld-Fourier method; size distribution; strain 169

wear-resistance

iron-based self-lubricant; metal-coated casting; wear-resistant gradient layer; microstructure; 109

wear-resistant gradient layer

iron-based self-lubricant; metal-coated casting; microstructure; wear-resistance 109

wear

friction; ceramics; methanol 19

